

**Indiana Department of Environmental Management  
Office of Air Management  
and Gary Division of Air Pollution Control**

**Technical Support Document (TSD) for a Part 70 Operating Permit**

**Source Background and Description**

**Source Name:** Bob Heine, Inc. d/b/a B & H Demolition  
**Source Location:** 7318 West 15<sup>th</sup> Avenue, Gary, Indiana 46406  
**County:** Lake  
**SIC Code:** 1429  
**Operation Permit No.:** T 089-11072-05203  
**Permit Reviewer:** Mark L. Kramer

The Office of Air Management (OAM) has reviewed a Part 70 permit application from Bob Heine, Inc. d/b/a B & H Demolition relating to the operation of a portable concrete crushing plant.

**Source Definition**

This concrete crushing company consists of two (2) portable plants:

- (a) Plant 1 is located at 7318 West 15th Avenue, Gary, Indiana 46406; and
- (b) Plant 2 is located at 7318 West 15th Avenue, Gary, Indiana 46406.

Since the two (2) plants are located in contiguous properties, have the same SIC codes and are owned by one (1) company, they will be considered one (1) source.

A separate Part 70 permit (T 089-10932-05063) will be issued to Bob Heine, Inc. d/b/a B & H Demolition for the other portable plant solely for administrative purposes.

**Permitted Emission Units and Pollution Control Equipment**

There are no permitted emission units and pollution control devices operating at this portable plant during this review process.

**Unpermitted Emission Units and Pollution Control Equipment**

There are no unpermitted emission units and pollution control devices operating at this portable plant during this review process.

**New Emission Units and Pollution Control Equipment Receiving Prior Approval**

The application includes information relating to the prior approval for the construction and operation of the following equipment pursuant to 326 IAC 2-7-5(16):

One (1) portable concrete crushing plant, to be installed, capacity: 250 tons per hour consisting of:

- (a) One (1) receiving hopper,
- (b) One (1) undercrusher gathering hopper,
- (c) One (1) vibrating grizzly feeder,
- (d) One (1) vibrating screen,
- (e) Five (5) conveyors,
- (f) One (1) horizontal shaft crusher, and
- (g) One (1) diesel generator, SO<sub>2</sub> rated at 320 horsepower or 2.27 million British thermal units per hour.

### **Insignificant Activities**

The source also consists of the following insignificant activities, as defined in 326 IAC 2-7-1(21):

- (a) Natural gas-fired combustion sources with heat input equal to or less than ten million (10,000,000) British thermal units per hour.
- (b) A petroleum fuel, other than gasoline, dispensing facility, having a storage capacity of less than or equal to 10,500 gallons, and dispensing less than or equal to 230,000 gallons per month.

### **Existing Approvals**

The source has been operating under previous approvals including, but not limited to, the following:

CP 089-6480-05063, issued December 31, 1996.

All conditions from previous approvals were incorporated into T 089-10932-05063.

### **Enforcement Issue**

There are no enforcement actions pending for this portable plant.

### **Recommendation**

The staff recommends to the Commissioner that the Part 70 permit be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

An administratively complete Part 70 permit application for the purposes of this review was received on June 21, 1999.

## Emission Calculations

See pages 1 - 7 of 7 of Appendix A of this document for detailed emissions calculations.

## Potential To Emit

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as “the maximum capacity of a stationary source to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA.” The following table summarizes the potential from this portable 250 ton per hour concrete crushing plant.

Pollutant	Potential To Emit (tons/year)
PM	542
PM <sub>10</sub>	440
SO <sub>2</sub>	2.87
VOC	3.52
CO	9.36
NO <sub>x</sub>	43.5

Note: For the purpose of determining Title V applicability for particulates, PM<sub>10</sub>, not PM, is the regulated pollutant in consideration.

HAPs	Potential To Emit (tons/year)
TOTAL	negligible

(a) The potential to emit (as defined in 326 IAC 2-1.1-1(16)) of PM<sub>10</sub> is equal to or greater than one hundred (100) tons per year and NO<sub>x</sub> is equal to or greater than twenty-five (25) tons per year in Lake county. Therefore, the source is subject to the provisions of 326 IAC 2-7.

(b) Fugitive Emissions

Since this type of operation is not one of the twenty-eight (28) listed source categories under 326 IAC 2-2 and since there are no applicable New Source Performance Standards that were in effect on August 7, 1980, the fugitive particulate matter (PM) and volatile organic compound (VOC) emissions are not counted toward determination of PSD and Emission Offset applicability.

## Actual Emissions

No previous emission data has been received from the source.

## Source Status

New Source PSD Definition (emissions after controls, based on 8,760 hours of operation per year at rated capacity):

Pollutant	Emissions (tons/yr)
PM	6.05
PM <sub>10</sub>	6.05
SO <sub>2</sub>	1.62
VOC	1.98
CO	5.26
NO <sub>x</sub>	24.1

This new source is **not** a major stationary source because no severe nonattainment pollutant (VOC or NO<sub>x</sub>) is not emitted at a rate of twenty-five (25) tons per year or greater and no nonattainment pollutant (PM<sub>10</sub> or SO<sub>2</sub>) is not emitted at a rate of one hundred (100) tons per year or greater and it is not in one of the 28 listed source categories. Therefore, pursuant to 326 IAC 2-3, the Emission Offset requirements do not apply.

## Limited Potential to Emit

The table below summarizes the total potential to emit, reflecting all limits, of the significant emission units and insignificant activities.

	Limited Potential to Emit (tons/year)						
Process/facility	PM	PM <sub>10</sub>	SO <sub>2</sub>	VOC	CO	NO <sub>x</sub>	HAPs
Concrete Processing Operations	252	200	0.00	0.00	0.00	0.00	0.00
Diesel Generator	1.73	1.73	1.62	1.98	5.26	24.4	Negligible
Insignificant Activities	0.5	0.5	0.5	1.0	1.0	0.5	Negligible
Total Emissions	254	202	2.12	2.98	6.26	24.9	Negligible

Note: The concrete processing operations include the fugitive PM and PM<sub>10</sub> emissions which are not counted toward determination of Emission Offset applicability. The total nonfugitive PM and PM<sub>10</sub> emissions from the concrete processing operations are both 4.32 tons per year. Therefore, the portable plant is not subject to the requirements of 326 IAC 2-3 (Emission Offset).

### County Attainment Status

The source is located in Lake County.

Pollutant	Status
PM <sub>10</sub>	nonattainment
SO <sub>2</sub>	nonattainment
NO <sub>2</sub>	nonattainment
Ozone	nonattainment
CO	attainment
Lead	attainment

Volatile organic compounds (VOC) and oxides of nitrogen (NO<sub>x</sub>) are precursors for the formation of ozone. Therefore, VOC and NO<sub>x</sub> emissions are considered when evaluating the rule applicability relating to the ozone standards. Lake County has been designated as nonattainment for ozone.

### Portable Source

(a) Initial Location

This is a portable source and its initial location is 7318 West 15th Avenue, Gary, Indiana 46406. An additional portable plant (200 ton per hour concrete crushing plant), to be permitted under T 089-10932-05063, is also sited at this same initial location.

(b) PSD and Emission Offset Requirements

The emissions from this portable source were reviewed under the requirements of the Prevention of Significant Deterioration (PSD), 326 IAC 2-2, 40 CFR 52.21, and Emission Offset, 326 IAC 2-3.

(c) Fugitive Emissions

Since this type of operation is not one of the twenty-eight (28) listed sources under 326 IAC 2-2 and since there are no applicable New Source Performance Standards that were in effect on August 7, 1980, the fugitive particulate matter (PM) and volatile organic compound (VOC) emissions are not counted toward determination of PSD and Emission Offset applicability.

(d) Local Agency

Based on the initial location of this source, the Gary Division of Air Pollution Control shall be contacted for additional air operating requirements. OAM has the authority to issue this construction permit.

### Federal Rule Applicability

- (a) This portable concrete crushing plant is subject to the New Source Performance Standard 326 IAC 12, 40 CFR 60.670 through 60.676, Subpart OOO. This rule requires the particulate emissions from:

- (1) the crushing operations to be limited to fifteen percent (15%) opacity or less, and
  - (2) the screening and conveying operations to be limited to ten percent (10%) or less.
- (b) There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs)(326 IAC 14 and 40 CFR Part 63) applicable to this source.

#### **State Rule Applicability - Entire Source**

##### **326 IAC 2-3 (Emission Offset Rules)**

In order for the portable diesel generator under this proposed permit and the other portable generator being permitted under T 089-10932-05063 at this source to operate without Emission Offset review and be able to be separately relocated, if desired, the source has agreed to limit the fuel usage to 79,273 gallons of diesel oil per twelve (12) consecutive month period to both diesel generators. This fuel oil limit is equivalent to 24.4 tons of NO<sub>x</sub> per year to avoid the applicability of 326 IAC 2-3 for both generators. This fuel usage limit was calculated as follows:

The potential NO<sub>x</sub> emissions for the 320 horsepower engine are 43.45 tons per year. 1 horsepower-hour equals 7,000 British thermal units. Therefore, 320 horsepower-hour x 7,000 British thermal units = 2.240 million British thermal units per hour. Assuming a heat content of 139,000 British thermal units per gallon, 320 horsepower-hour equates to 2,240,000 British thermal units per hour divided by 139,000 British thermal units per gallon or 16.115 gallons of diesel fuel oil per hour. Therefore, 43.45 tons of NO<sub>x</sub> per year is equivalent to 16.115 gallons/hour \* 8,760 hours/year = 141,168 gallons/year. To limit NO<sub>x</sub> emissions to 24.4 tons per year is equivalent to 141,168 gallons/yr x 24.4/43.45 = 79,274 gallons/year.

In addition, if this portable generator is to be relocated to another location in a severe nonattainment area, then the generator will be limited to a fuel usage equivalent of under twenty-five (25) tons per year including existing NO<sub>x</sub> and VOC emissions from significant emission units and insignificant activities.

If this portable generator is to be relocated to another location by itself in a severe ozone nonattainment area, then the total input of diesel fuel oil to the diesel generator shall be limited to 79,273 gallons per twelve (12) consecutive month period. This fuel limit is equivalent to 24.4 tons of NO<sub>x</sub> per year. Therefore, the requirements of 326 IAC 2-3 (Emission Offset) would not apply.

If this portable generator is to be relocated to a nonattainment or an attainment areas for ozone, then the generator will be limited to a fuel usage equivalent of under one hundred (100) tons per year including existing NO<sub>x</sub> and VOC emissions from significant emission units and insignificant activities.

If this portable generator is to be relocated to another location by itself to a nonattainment or an attainment areas for ozone, then no fuel usage limit is necessary because the potential NO<sub>x</sub> and VOC emissions are each less than one hundred (100) tons per year.

##### **326 IAC 2-6 (Emission Reporting)**

This source is subject to 326 IAC 2-6 (Emission Reporting), because it has the potential to emit more than ten (10) tons per year of NO<sub>x</sub> and one hundred (100) tons per year of PM<sub>10</sub> in Lake County. Pursuant to this rule, the owner/operator of the source must annually submit an emission statement for the source. The annual statement must be received by April 15 of each year and contain the minimum requirement as specified in 326 IAC 2-6-4. The submittal should cover the period defined in 326 IAC 2-6-2(8)(Emission Statement Operating Year).

326 IAC 5-1 (Opacity Emissions Limitations)

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Exemptions), opacity shall meet the following, unless otherwise stated in this permit:

- (a) Opacity shall not exceed an average of twenty percent (20%) any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
- (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

326 IAC 6-1-11.1 (Lake County Fugitive Particulate Matter Control Requirements)

The source will be in violation of 326 IAC 6-1-11.1 (Lake County Fugitive Particulate Matter Control Requirements), if the opacity of fugitive particulate emissions exceeds ten percent (10%). Compliance with this opacity limit shall be achieved by controlling fugitive particulate matter emissions according to the plan submitted on June 21, 1999.

326 IAC 6-4 (Fugitive Dust Emissions Limitations)

This rule requires that the source not generate fugitive dust to the extent that some portion of the material escapes beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located.

326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations)

Pursuant to 326 IAC 6-5 (Fugitive Particulate Matter Emissions Limitations), fugitive particulate matter emissions shall be controlled according to the plan submitted on June 21, 1999. This plan consists of applying water on an as-needed basis to unpaved roads and storage piles.

**State Rule Applicability - Individual Facilities**

326 IAC 6-1 (Nonattainment Area Limitations)

In order to be able to relocate the portable concrete crushing plant to any nonattainment county designated by 326 IAC 6-1-7, the portable plant facilities shall meet the allowable PM emission limitation pursuant to 326 IAC 6-1-2 (a) of 0.03 grains per standard dry cubic feet per minute. However, pursuant to 326 IAC 6-1-2(g), all operations subject to 326 IAC 6-1-2 where the process is totally enclosed and thus it is practical to measure there from shall comply with the PM emission limit. The concrete crushing source which is not enclosed is subject to 326 IAC 6-1-2(g) that requires compliance with 326 IAC 2, 326 IAC 5-1 and 326 IAC 6-4.

326 IAC 2-7-6(1),(6) (Testing Requirements) and NSPS Subpart OOO

During the period between 30 and 36 months after issuance of this permit, the Permittee shall perform opacity testing for all emission units subject to the testing provisions of NSPS Subpart OOO. This test shall be repeated at least once every five (5) years from the date of this valid compliance demonstration. In addition to these requirements, IDEM may require compliance testing when necessary to determine if the facility is in compliance.

326 IAC 7-1.1 (Sulfur dioxide emission limitations)

Since the source does not have the potential to emit twenty-five (25) tons per year or more of SO<sub>2</sub>, this rule is not applicable.

### **Compliance Requirements**

Permits issued under 326 IAC 2-7 are required to ensure that sources can demonstrate compliance with applicable state and federal rules on a more or less continuous basis. All state and federal rules contain compliance provisions, however, these provisions do not always fulfill the requirement for a more or less continuous demonstration. When this occurs IDEM, OAM, in conjunction with the source, must develop specific conditions to satisfy 326 IAC 2-7-5. As a result, compliance requirements are divided into two sections: Compliance Determination Requirements and Compliance Monitoring Requirements.

Compliance Determination Requirements in Section D of the permit are those conditions that are found more or less directly within state and federal rules and the violation of which serves as grounds for enforcement action. If these conditions are not sufficient to demonstrate continuous compliance, they will be supplemented with Compliance Monitoring Requirements, also Section D of the permit. Unlike Compliance Determination Requirements, failure to meet Compliance Monitoring conditions would serve as a trigger for corrective actions and not grounds for enforcement action. However, a violation in relation to a compliance monitoring condition will arise through a source's failure to take the appropriate corrective actions within a specific time period.

The concrete crushing facilities have applicable compliance monitoring requirements as specified below:

Daily visible emissions notations of the particulate matter emissions from the portable concrete crushing plant (crushing, screening and conveying processes) shall be performed during normal daylight operations. A trained employee will record whether emissions are normal or abnormal. For processes operated continuously "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time. In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions. A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process. The Compliance Response Plan for this unit shall contain troubleshooting contingency and response steps for when an abnormal emission is observed.

These monitoring conditions are necessary to ensure compliance with 326 IAC 5-1 (Opacity) and NSPS Subpart OOO and 326 IAC 2-7.

### **Air Toxic Emissions**

Indiana presently requests applicants to provide information on emissions of the 188 hazardous air pollutants (HAPs) set out in the Clean Air Act Amendments of 1990. These pollutants are either carcinogenic or otherwise considered toxic and are commonly used by industries. They are listed as air toxics on the Office of Air Management (OAM) Part 70 Application Form GSD-08.

This source will emit levels of air toxics less than those which constitute a major source according to Section 112 of the 1990 Clean Air Act Amendments.



### **Conclusion**

The operation of this portable concrete crushing plant shall be subject to the conditions of the attached proposed **Part 70 Permit No. T 089-11072-05203**.

Appendix A: Emission Calculations

Concrete Processing

Company Name:	Bob Heine, Inc. , d/b/a B & H Demolition
Address City IN Zip:	7318 West 15th Avenue, Gary, Indiana 46406
Part 70:	T 089-11072
Plt ID:	089-05203
Reviewer:	Mark L. Kramer
Date:	June 21, 1999

\*\* emissions before controls \*\*  
(TSP)

Storage		** see page 2 **			3.88 tons/yr	AP-42 Ch.11.2.3 (Fourth edition, no update)
Transporting		** see page 3 **			490.50 tons/yr	AP-42 Ch.13.2.2 (Supplement E, 9/98)
Loading & Unloading	250 ton/hr x	0.0016 lb/ton	/ 2000 lb/ton x	8760 hr/yr =	1.77 tons/yr	AP-42 Ch.13.2.4 (Fifth edition, 1/95)
Loading (primary)	250 ton/hr x	0.00504 lb/ton	/ 2000 lb/ton x	8760 hr/yr =	5.52 tons/yr	AP-42 Ch.11.19.2 (Fifth edition, 1/95)
Loading (secondary)	0 ton/hr x	0.00504 lb/ton	/ 2000 lb/ton x	8760 hr/yr =	0.00 tons/yr	AP-42 Ch.11.19.2 (Fifth edition, 1/95)
Loading (tertiary)	0 ton/hr x	0.00504 lb/ton	/ 2000 lb/ton x	8760 hr/yr =	0.00 tons/yr	AP-42 Ch.11.19.2 (Fifth edition, 1/95)
Screening	250 ton/hr x	0.0315 lb/ton	/ 2000 lb/ton x	8760 hr/yr =	34.49 tons/yr	AP-42 Ch.11.19.2 (Fifth edition, 1/95)
Receiver Transfer	250 ton/hr x	0.00294 lb/ton	/ 2000 lb/ton x	8760 hr/yr =	3.22 tons/yr	AP-42 Ch.11.19.2 (Fifth edition, 1/95)
Total emissions before controls:					539.38 tons/yr	

\*\* emissions after controls \*\*

Storage	3.88 tons/yr x	10% emitted after controls =	0.39 tons/yr
Transporting	490.50 tons/yr x	50% emitted after controls =	245.25 tons/yr
Loading & Unloading	1.77 tons/yr x	100% emitted after controls =	1.77 tons/yr
Loading (primary)	5.52 tons/yr x	10% emitted after controls =	0.55 tons/yr
Loading (secondary)	0.00 tons/yr x	10% emitted after controls =	0.00 tons/yr
Loading (tertiary)	0.00 tons/yr x	10% emitted after controls =	0.00 tons/yr
Screening	34.49 tons/yr x	10% emitted after controls =	3.45 tons/yr
Receiving	3.22 tons/yr x	10% emitted after controls =	0.32 tons/yr
Total emissions after controls:			251.73 tons/yr

Heine, Inc. , d/b/a B & H Demolition  
8 West 15th Avenue, Gary, Indiana 46406

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\* \* fugitive vs. nonfugitive \* \*

Storage	3.88 tons/yr x	10% emitted after controls =	0.39 tons/yr
Transporting	490.50 tons/yr x	50% emitted after controls =	245.25 tons/yr
Unloading	1.77 tons/yr x	100% emitted after controls =	1.77 tons/yr
Total fugitive emissions:			247.41 tons/yr
Shedding (primary)	5.52 tons/yr x	10% emitted after controls =	0.55 tons/yr
Shedding (secondary)	0.00 tons/yr x	10% emitted after controls =	0.00 tons/yr
Shedding (tertiary)	0.00 tons/yr x	10% emitted after controls =	0.00 tons/yr
Sealing	34.49 tons/yr x	10% emitted after controls =	3.45 tons/yr
Leaking	3.22 tons/yr x	10% emitted after controls =	0.32 tons/yr
Total nonfugitive emissions:			4.323 tons/yr

\* \* storage \* \*

Storage emissions, which result from wind erosion, are determined by the following calculations:

$$E_f = 1.7 \cdot (s/1.5) \cdot (365-p)/235 \cdot (f/15)$$

$$= 4.63 \text{ lb/acre/day}$$

where s = 4 % silt content of material

p = 125 days of rain greater than or equal to 0.01 inches

f = 15 % of wind greater than or equal to 12 mph

$$E_p (\text{storage}) = E_f \cdot sc \cdot (40 \text{ cuft/ton}) / (2000 \text{ lb/ton}) / (43560 \text{ sqft/acre}) / (25 \text{ ft}) \cdot (365 \text{ day/yr})$$

$$= 3.88 \text{ tons/yr}$$

where sc = 125,000 tons storage capacity

**\*\* unpaved roads \*\***

Following calculations determine the amount of emissions created by unpaved roads, based on 8760 hours of use and AP-42, Ch 13.2.2 (Supplement E, 9/98). Two methods are provided for calculating emissions. The first does not consider natural mitigation due to precipitation.

$$\begin{aligned} & 14.71 \text{ trip/hr} \times \\ & 0.36 \text{ mile/trip} \times \\ & 2 \text{ (round trip)} \times \\ & 8760 \text{ hr/yr} = 92752.9 \text{ miles per year} \end{aligned}$$

Method 1:

$$E_f = k \left[ \left( \frac{s}{12} \right)^{0.8} \right] \left[ \left( \frac{W}{3} \right)^b \right] \left[ \left( \frac{M}{0.2} \right)^c \right]$$

= 16.09 lb/mile

where k = 10 (particle size multiplier for PM-10 (k=10 for PM-30 or TSP))  
s = 5 mean % silt content of unpaved roads  
b = 0.5 Constant for PM-10 (b = 0.5 for PM-30 or TSP)  
c = 0.4 Constant for PM-10 (c = 0.4 for PM-30 or TSP)  
W = 31.50 tons average vehicle weight  
M = 0.2 surface material moisture content, % (default is 0.2 for dry conditions)

$$\frac{16.09 \text{ lb/mi} \times 92752.9 \text{ mi/yr}}{2000 \text{ lb/ton}} = 745.97 \text{ tons/yr}$$

This method has a lower quality rating than Method 1.

Method 2

$$E_f = \left\{ k \left[ \left( \frac{s}{12} \right)^{0.8} \right] \left[ \left( \frac{W}{3} \right)^b \right] \left[ \left( \frac{M_{dry}}{0.2} \right)^c \right] \right\} \left[ \frac{(365-p)}{365} \right]$$

= 10.58 lb/mile

(particle size multiplier for PM-10) (k=10 for PM-30 or TSP)  
where k = 10  
s = 5 mean % silt content of unpaved roads  
b = 0.5 Constant for PM-10 (b = 0.5 for PM-30 or TSP)  
c = 0.4 Constant for PM-10 (c = 0.4 for PM-30 or TSP)  
W = 31.50 tons average vehicle weight  
M<sub>dry</sub> = 0.2 surface material moisture content, % (default is 0.2 for dry conditions)  
p = 125 number of days with at least 0.254mm of precipitation (See Figure 13.2.2-1)

$$\frac{10.58 \text{ lb/mi} \times 92752.9411764705883 \text{ mi/yr}}{2000 \text{ lb/ton}} = 490.50 \text{ tons/yr}$$

**\*\* aggregate handling \*\***

Following calculations determine the amount of emissions created by truck loading and unloading of aggregate, based on 8760 hours of use and AP-42, Ch 13.2.4 (Fifth edition, 1/95).

$$E_f = k \cdot (0.0032) \cdot (U/5)^{1.3} \cdot (M/2)^{1.4}$$

= 0.0016 lb/ton

where k = 0.74 (particle size multiplier)  
U = 10 mile/hr mean wind speed  
M = 5 % material moisture content

## Appendix A: Emission Calculations

### Concrete Processing

**Company Name:** Bob Heine, Inc. , d/b/a B & H Demolition  
**Address City IN Zip:** 7318 West 15th Avenue, Gary, Indiana 46406  
**Part 70:** T 089-10932  
**Plt ID:** 089-05063  
**Reviewer:** Mark L. Kramer  
**Date:** May 3, 1999

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\*\* emissions before controls \*\*

PM-10

range		** see page 2 **			3.88 tons/yr
nsporting		** see page 3 **			387.72 tons/yr
ding & Unloading	250 ton/hr x	0.0016 lb/ton	/ 2000 lb/ton x	8760 hr/yr =	1.77 tons/yr
shing (primary)	250 ton/hr x	0.00504 lb/ton	/ 2000 lb/ton x	8760 hr/yr =	5.52 tons/yr
shing (secondary)	0 ton/hr x	0.00504 lb/ton	/ 2000 lb/ton x	8760 hr/yr =	0.00 tons/yr
shing (tertiary)	0 ton/hr x	0.00504 lb/ton	/ 2000 lb/ton x	8760 hr/yr =	0.00 tons/yr
eening	250 ton/hr x	0.0315 lb/ton	/ 2000 lb/ton x	8760 hr/yr =	34.49 tons/yr
iveyor Transfer	250 ton/hr x	0.00294 lb/ton	/ 2000 lb/ton x	8760 hr/yr =	3.22 tons/yr
al emissions before controls:					436.60 tons/yr

AP-42 Ch.11.2.3 (Fourth edition, no update)

AP-42 Ch.13.2.2 (Supplement E, 9/98)

AP-42 Ch.13.2.4 (Fifth edition, 1/95)

AP-42 Ch.11.19.2 (Fifth edition, 1/95)

AP-42 Ch.11.19.2 (Fifth edition, 1/95)

AP-42 Ch.11.19.2 (Fifth edition, 1/95)

AP-42 Ch.11.19.2 (Fifth edition, 1/95)

AP-42 Ch.11.19.2 (Fifth edition, 1/95)

\*\* emissions after controls \*\*

range	3.88 tons/yr x	10% emitted after controls =	0.39 tons/yr
nsporting	387.72 tons/yr x	50% emitted after controls =	193.86 tons/yr
ding & Unloading	1.77 tons/yr x	100% emitted after controls =	1.77 tons/yr
shing (primary)	5.52 tons/yr x	10% emitted after controls =	0.55 tons/yr
shing (secondary)	0.00 tons/yr x	10% emitted after controls =	0.00 tons/yr
shing (tertiary)	0.00 tons/yr x	10% emitted after controls =	0.00 tons/yr
eening	34.49 tons/yr x	10% emitted after controls =	3.45 tons/yr
iveying	3.22 tons/yr x	10% emitted after controls =	0.32 tons/yr
al emissions after controls:			200.34 tons/yr

Heine, Inc. , d/b/a B & H Demolition  
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\* \* fugitive vs. nonfugitive \* \*

Storage	3.88 tons/yr x	10% emitted after controls =	0.39 tons/yr
Transporting	387.72 tons/yr x	50% emitted after controls =	193.86 tons/yr
Unloading / Unloading	1.77 tons/yr x	100% emitted after controls =	1.77 tons/yr
Total fugitive emissions:			196.02 tons/yr
Storage (primary)	5.52 tons/yr x	10% emitted after controls =	0.55 tons/yr
Storage (secondary)	0.00 tons/yr x	10% emitted after controls =	0.00 tons/yr
Storage (tertiary)	0.00 tons/yr x	10% emitted after controls =	0.00 tons/yr
Sealing	34.49 tons/yr x	10% emitted after controls =	3.45 tons/yr
Leaking:	3.22 tons/yr x	10% emitted after controls =	0.32 tons/yr
Total nonfugitive emissions:			4.323 tons/yr

\* \* storage \* \*

Storage emissions, which result from wind erosion, are determined by the following calculations:

$$E_f = 1.7 \cdot (s/1.5) \cdot (365-p)/235 \cdot (f/15)$$

$$= 4.63 \text{ lb/acre/day}$$

where s = 4 % silt content of material

p = 125 days of rain greater than or equal to 0.01 inches

f = 15 % of wind greater than or equal to 12 mph

$$E_p (\text{storage}) = E_f \cdot sc \cdot (40 \text{ cuft/ton}) / (2000 \text{ lb/ton}) / (43560 \text{ sqft/acre}) / (25 \text{ ft}) \cdot (365 \text{ day/yr})$$

$$= 3.88 \text{ tons/yr}$$

where sc = 125 ,000 tons storage capacity

**\*\* unpaved roads \*\***

Following calculations determine the amount of emissions created by unpaved roads, based on 8760 hours of use and AP-42, Ch 13.2.2 (Supplement E, 9/98). Two methods are provided for calculating emissions. The first does not consider natural mitigation due to precipitation.

$$\begin{aligned} & 14.71 \text{ trip/hr} \times \\ & 0.36 \text{ mile/trip} \times \\ & 2 \text{ (round trip)} \times \\ & 8760 \text{ hr/yr} = 92752.9 \text{ miles per year} \end{aligned}$$

Method 1:

$$E_f = k \left[ \frac{s}{12} \right]^{0.8} \left[ \frac{W}{3} \right]^b \left[ \frac{M}{0.2} \right]^c$$

= 12.71 lb/mile

where k = 10 (particle size multiplier for PM-10 (k=10 for PM-30 or TSP))  
s = 5 mean % silt content of unpaved roads  
b = 0.4 Constant for PM-10 (b = 0.5 for PM-30 or TSP)  
c = 0.3 Constant for PM-10 (c = 0.4 for PM-30 or TSP)  
W = 31.50 tons average vehicle weight  
M = 0.2 surface material moisture content, % (default is 0.2 for dry conditions)

$$\frac{12.71 \text{ lb/mi} \times 92752.9 \text{ mi/yr}}{2000 \text{ lb/ton}} = 589.66 \text{ tons/yr}$$

This method has a lower quality rating than Method 1.

Method 2

$$E_f = \left\{ k \left[ \frac{s}{12} \right]^{0.8} \left[ \frac{W}{3} \right]^b \left[ \frac{M_{dry}}{0.2} \right]^c \right\} \left[ \frac{365-p}{365} \right]$$

= 8.36 lb/mile

(particle size multiplier for PM-10) (k=10 for PM-30 or TSP)  
s = 5 mean % silt content of unpaved roads  
b = 0.4 Constant for PM-10 (b = 0.5 for PM-30 or TSP)  
c = 0.3 Constant for PM-10 (c = 0.4 for PM-30 or TSP)  
W = 31.50 tons average vehicle weight  
M<sub>dry</sub> = 0.2 surface material moisture content, % (default is 0.2 for dry conditions)  
p = 125 number of days with at least 0.254mm of precipitation (See Figure 13.2.2-1)

$$\frac{8.36 \text{ lb/mi} \times 92752.9411764705883 \text{ mi/yr}}{2000 \text{ lb/ton}} = 387.72 \text{ tons/yr}$$

**\*\* aggregate handling \*\***

Following calculations determine the amount of emissions created by truck loading and unloading of aggregate, based on 8760 hours of use and AP-42, Ch 13.2.4 (Fifth edition, 1/95).

$$E_f = k(0.0032) \left( \frac{U}{5} \right)^{1.3} \left( \frac{M}{2} \right)^{1.4}$$

= 0.0016 lb/ton

where k = 0.74 (particle size multiplier)  
U = 10 mile/hr mean wind speed  
M = 5 % material moisture content

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**Emissions calculated based on output rating (hp)**

Heat Input Capacity                      Potential Throughput  
 (hp)    hp-hr/yr

320.0    2803200.0

	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
Emission Factor in lb/hp-hr	0.0022	0.0022	0.0021	0.0310	0.0025	0.0067
Potential Emission in tons/yr	3.08	3.08	2.87	43.45	3.52	9.36

**Methodology**

Potential Throughput (hp-hr/yr) = hp \* 8760 hr/yr

Emission Factors are from AP42 (Supplement B 10/96), Table 3.3-2

Emission (tons/yr) = [Heat input rate (MMBtu/hr) x Emission Factor (lb/MMBtu)] \* 8760 hr/yr / (2,000 lb/ton )

Emission (tons/yr) = [Potential Throughput (hp-hr/yr) x Emission Factor (lb/hp-hr)] / (2,000 lb/ton )

PM10 emission factors are assumed to be equivalent to PM10 emission factors. No information was given regarding which method was used to determine the factor or the fraction of PM10 which is condensable.



## **Subpart 000-Standards of Performance for Nonmetallic Mineral Processing Plants**

Source: 51 FR 31337, Aug. 1, 1985, unless otherwise noted.

### **§ 60.670 Applicability and designation of affected facility.**

(a) Except as provided in paragraphs (b), (c) and (d) of this section, the provisions of this subpart are applicable to the following affected facilities in fixed or portable nonmetallic mineral processing plants: each crusher, grinding mill, screening operation, bucket elevator, belt conveyor, bagging operation, storage bin, enclosed truck or railcar loading station.

(b) An affected facility that is subject to the provisions of subpart F or I or that follows in the plant process any facility subject to the provisions of subparts F or I of this part is not subject to the provisions of this subpart.

(c) Facilities at the following plants are not subject to the provisions of this subpart:

(1) Fixed sand and gravel plants and crushed stone plants with capacities, as defined in § 60.671, of 23 megagrams per hour (25 tons per hour) or less;

(2) Portable sand and gravel plants and crushed stone plants with capacities, as defined in § 60.671, of 136 megagrams per hour (150 tons per hour) or less; and

(3) Common clay plants and pumice plants with capacities, as defined in § 60.671, of 9 megagrams per hour (10 tons per hour) or less.

(d)(1) When an existing facility is replaced by a piece of equipment of equal or smaller size, as defined in § 60.671, having the same function as the existing facility, the new facility is exempt from the provisions of §§ 60.672, 60.674, and 60.675 except as provided for in paragraph (d)(3) of this section.

(2) An owner or operator seeking to comply with this paragraph shall comply with the reporting requirements of § 60.676 (a) and (b).

(3) An owner or operator replacing all existing facilities in a production line with new facilities does not qualify for the exemption described in paragraph (d)(1) of this section and must comply with the provisions of §§ 60.672, 60.674 and 60.675.

(e) An affected facility under paragraph (a) of this section that commences construction, reconstruction, or modification after August 31, 1983 is subject to the requirements of this part.

### **§ 60.671 Definitions.**

All terms used in this subpart, but not specifically defined in this section, shall have the meaning given them in the Act and in subpart A of this part.

Bagging operation means the mechanical process by which bags are filled with nonmetallic minerals.

Belt conveyor means a conveying device that transports material from one location to another by means of an endless belt that is carried on a series of idlers and routed around a pulley at each end.

Bucket elevator means a conveying device of nonmetallic minerals consisting of a head and foot assembly which supports and drives an endless single or double strand chain or belt to which buckets are attached.

Building means any frame structure with a roof.

Capacity means the cumulative rated capacity of all initial crushers that are part of the plant.

Capture system means the equipment (including enclosures, hoods, ducts, fans, dampers, etc.) used to capture and transport particulate matter generated by one or more process operations to a control device.

Control device means the air pollution control equipment used to reduce particulate matter emissions released to the atmosphere from one or more process operations at a nonmetallic mineral processing plant.

Conveying system means a device for transporting materials from one piece of equipment or location to another location within a plant. Conveying systems include but are not limited to the following: Feeders, belt conveyors, bucket elevators and pneumatic systems.

Crusher means a machine used to crush any nonmetallic minerals, and includes, but is not limited to, the following types: jaw, gyratory, cone, roll, rod mill, hammermill, and impactor.

Enclosed truck or railcar loading station means that portion of a nonmetallic mineral processing plant where nonmetallic minerals are loaded by an enclosed conveying system into enclosed trucks or railcars.

Fixed plant means any nonmetallic mineral processing plant at which the processing equipment specified in § 60.670(a) is attached by a cable, chain, turnbuckle, bolt or other means (except electrical connections) to any anchor, slab, or structure including bedrock.

Fugitive emission means particulate matter that is not collected by a capture system and is released to the atmosphere at the point of generation.

Grinding mill means a machine used for the wet or dry fine crushing of any nonmetallic mineral. Grinding mills include, but are not limited to, the following types: hammer, roller, rod, pebble and ball, and fluid energy. The grinding mill includes the air conveying system, air separator, or air classifier, where such systems are used.

Initial crusher means any crusher into which nonmetallic minerals can be fed without prior crushing in the plant.

Nonmetallic mineral means any of the following minerals or

any mixture of which the majority is any of the following minerals:

- (a) Crushed and Broken Stone, including Limestone, Dolomite, Granite, Traprock, Sandstone, Quartz, Quartzite, Marl, Marble, Slate, Shale, Oil Shale, and Shell.
- (b) Sand and Gravel.
- (c) Clay including Kaolin, Fireclay, Bentonite, Fuller's Earth, Ball Clay, and Common Clay.
- (d) Rock Salt.
- (e) Gypsum.
- (f) Sodium Compounds, including Sodium Carbonate, Sodium Chloride, and Sodium Sulfate.
- (g) Pumice.
- (h) Gilsonite.
- (i) Talc and Pyrophyllite.
- (j) Boron, including Borax, Kernite, and Colemanite.
- (k) Barite.
- (l) Fluorospars.
- (m) Feldspar.
- (n) Diatomite.
- (o) Perlite.
- (p) Vermiculite.
- (q) Mica.
- (r) Kyanite, including Andalusite, Sillimanite, Topaz, and Dumortierite.

Nonmetallic mineral processing plant means any combination of equipment that is used to crush or grind any nonmetallic mineral wherever located, including lime plants, power plants, steel mills, asphalt concrete plants, portland cement plants, or any other facility processing nonmetallic minerals except as provided in § 60.670 (b) and (c).

Portable plant means any nonmetallic mineral processing plant that is mounted on any chassis or skids and may be moved by the application of a lifting or pulling force. In addition, there shall be no cable, chain, turnbuckle, bolt or other means (except electrical connections) by which any piece of equipment is attached or clamped to any anchor, slab, or structure, including bedrock that must be removed prior to the application of a lifting or pulling force for the purpose of transporting the unit.

Production line means all affected facilities (crushers, grinding mills, screening operations, bucket elevators, belt conveyors, bagging operations, storage bins, and enclosed truck and railcar loading stations) which are directly connected or are connected together by a conveying system.

Screening operation means a device for separating material according to size by passing undersize material through one or more mesh surfaces (screens) in series, and retaining oversize material on the mesh surfaces (screens).

Size means the rated capacity in tons per hour of a crusher, grinding mill, bucket elevator, bagging operation, or enclosed truck or railcar loading station; the total surface area of the top screen of a screening operation; the width of a conveyor belt; and the rated capacity in tons of a storage bin.

Stack emission means the particulate matter that is released

to the atmosphere from a capture system.

Storage bin means a facility for storage (including surge bins) or nonmetallic minerals prior to further processing or loading.

Transfer point means a point in a conveying operation where the nonmetallic mineral is transferred to or from a belt conveyor except where the nonmetallic mineral is being transferred to a stockpile.

Truck dumping means the unloading of nonmetallic minerals from movable vehicles designed to transport nonmetallic minerals from one location to another. Movable vehicles include but are not limited to: trucks, front end loaders, skip hoists, and railcars.

Vent means an opening through which there is mechanically induced air flow for the purpose of exhausting from a building air carrying particulate matter emissions from one or more affected facilities.

#### **§ 60.672 Standard for particulate matter.**

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any transfer point on belt conveyors or from any other affected facility any stack emissions which:

- (1) Contain particulate matter in excess of 0.05 g/dscm; or
- (2) Exhibit greater than 7 percent opacity, unless the stack emissions are discharged from an affected facility using a wet scrubbing control device. Facilities using a wet scrubber must comply with the reporting provisions of § 60.676 (c), (d), and (e).

(b) On and after the sixtieth day after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any transfer point on belt conveyors or from any other affected facility any fugitive emissions which exhibit greater than 10 percent opacity, except as provided in paragraphs (c), (d) and (e) of this section.

(c) On and after the sixtieth day after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup, no owner or operator shall cause to be discharged into the atmosphere from any crusher, at which a capture system is not used, fugitive emissions which exhibit greater than 15 percent opacity.

(d) Truck dumping of nonmetallic minerals into any screening operation, feed hopper, or crusher is exempt from the requirements of this section.

(e) If any transfer point on a conveyor belt or any other affected facility is enclosed in a building, then each enclosed affected facility must comply with the emission limits in paragraphs

(a), (b) and (c) of this section, or the building enclosing the affected facility or facilities must comply with the following emission limits:

(1) No owner or operator shall cause to be discharged into the atmosphere from any building enclosing any transfer point on a conveyor belt or any other affected facility any visible fugitive emissions except emissions from a vent as defined in § 60.671.

(2) No owner or operator shall cause to be discharged into the atmosphere from any vent of any building enclosing any transfer point on a conveyor belt or any other affected facility emissions which exceed the stack emissions limits in paragraph (a) of this section.

#### **§ 60.673 Reconstruction.**

(a) The cost of replacement of ore-contact surfaces on processing equipment shall not be considered in calculating either the "fixed capital cost of the new components" or the "fixed capital cost that would be required to construct a comparable new facility" under § 60.15. Ore-contact surfaces are crushing surfaces; screen meshes, bars, and plates; conveyor belts; and elevator buckets.

(b) Under § 60.15, the "fixed capital cost of the new components" includes the fixed capital cost of all depreciable components (except components specified in paragraph (a) of this section) which are or will be replaced pursuant to all continuous programs of component replacement commenced within any 2-year period following August 31, 1983.

#### **§ 60.674 Monitoring of operations.**

The owner or operator of any affected facility subject to the provisions of this subpart which uses a wet scrubber to control emissions shall install, calibrate, maintain and operate the following monitoring devices:

(a) A device for the continuous measurement of the pressure loss of the gas stream through the scrubber. The monitoring device must be certified by the manufacturer to be accurate within  $\pm 250$  pascals  $\pm 1$  inch water gauge pressure and must be calibrated on an annual basis in accordance with manufacturer's instructions.

(b) A device for the continuous measurement of the scrubbing liquid flow rate to the wet scrubber. The monitoring device must be certified by the manufacturer to be accurate within  $\pm 5$  percent of design scrubbing liquid flow rate and must be calibrated on an annual basis in accordance with manufacturer's instructions.

#### **§ 60.675 Test methods and procedures.**

(a) In conducting the performance tests required in § 60.8,

the owner or operator shall use as reference methods and procedures the test methods in appendix A of this part or other methods and procedures as specified in this section, except as provided in § 60.8(b). Acceptable alternative methods and procedures are given in paragraph (e) of this section.

(b) The owner or operator shall determine compliance with the particulate matter standards in § 60.272(a) as follows:

(1) Method 5 or Method 17 shall be used to determine the particulate matter concentration. The sample volume shall be at least 1.70 dscm (60 dscf). For Method 5, if the gas stream being sampled is at ambient temperature, the sampling probe and filter may be operated without heaters. If the gas stream is above ambient temperature, the sampling probe and filter may be operated at a temperature high enough, but no higher than 121 EC (250 EF), to prevent water condensation on the filter.

(2) Method 9 and the procedures in § 60.11 shall be used to determine opacity.

(c) In determining compliance with the particulate matter standards in § 60.672 (b) and (c), the owner or operator shall use Method 9 and the procedures in § 60.11, with the following additions:

(1) The minimum distance between the observer and the emission source shall be 4.57 meters (15 feet).

(2) The observer shall, when possible, select a position that minimizes interference from other fugitive emission sources (e.g., road dust). The required observer position relative to the sun (Method 9, Section 2.1) must be followed.

(3) For affected facilities using wet dust suppression for particulate matter control, a visible mist is sometimes generated by the spray. The water mist must not be confused with particulate matter emissions and is not to be considered a visible emission. When a water mist of this nature is present, the observation of emissions is to be made at a point in the plume where the mist is no longer visible.

(d) In determining compliance with § 60.672(e), the owner or operator shall use Method 22 to determine fugitive emissions. The performance test shall be conducted while all affected facilities inside the building are operating. The performance test for each building shall be at least 75 minutes in duration, with each side of the building and the roof being observed for at least 15 minutes.

(e) The owner or operator may use the following as alternatives to the reference methods and procedures specified in this section:

(1) For the method and procedure of paragraph (c) of this section, if emissions from two or more facilities continuously interfere so that the opacity of fugitive emissions from an individual affected facility cannot be read, either of the following procedures may be used:

(i) Use for the combined emission stream the highest fugitive opacity standard applicable to any of the individual affected facilities contributing to the emissions stream.

(ii) Separate the emissions so that the opacity of emissions from each affected facility can be read.

(f) To comply with § 60.676(d), the owner or operator shall record the measurements as required § 60.676(c) using the monitoring devices in § 60.674 (a) and (b) during each particulate matter run and shall determine the averages.

[54 FR 6680, Feb. 14, 1989]

#### **§ 60.676 Reporting and recordkeeping.**

(a) Each owner or operator seeking to comply with § 60.670(d) shall submit to the Administrator the following information about the existing facility being replaced and the replacement piece of equipment.

(1) For a crusher, grinding mill, bucket elevator, bagging operation, or enclosed truck or railcar loading station:

(i) The rated capacity in tons per hour of the existing facility being replaced and

(ii) The rated capacity in tons per hour of the replacement equipment.

(2) For a screening operation:

(i) The total surface area of the top screen of the existing screening operation being replaced and

(ii) The total surface area of the top screen of the replacement screening operation.

(3) For a conveyor belt:

(i) The width of the existing belt being replaced and

(ii) The width of the replacement conveyor belt.

(4) For a storage bin:

(i) The rated capacity in tons of the existing storage bin being replaced and

(ii) The rated capacity in tons of replacement storage bins.

(b) Each owner or operator seeking to comply with § 60.670(d) shall submit the following data to the Director of the Emission Standards and Engineering Division, (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711.

(1) The information described in § 60.676(a).

(2) A description of the control device used to reduce particulate matter emissions from the existing facility and a list of all other pieces of equipment controlled by the same control device; and

(3) The estimated age of the existing facility.

(c) During the initial performance test of a wet scrubber, and daily thereafter, the owner or operator shall record the measurements of both the change in pressure of the gas stream across the scrubber and the scrubbing liquid flow rate.

(d) After the initial performance test of a wet scrubber, the owner or operator shall submit semiannual reports to the Administrator of occurrences when the measurements of the scrubber pressure loss (or gain) and liquid flow rate differ by more than  $\pm 30$  percent from the averaged determined during the most

recent performance test.

(e) The reports required under paragraph (d) shall be postmarked within 30 days following end of the second and fourth calendar quarters.

(f) The owner or operator of any affected facility shall submit written reports of the results of all performance tests conducted to demonstrate compliance with the standards set forth in § 60.672, including reports of opacity observations made using Method 9 to demonstrate compliance with § 60.672 (b) and (c) and reports of observations using Method 22 to demonstrate compliance with § 60.672(e).

(g) The requirements of this paragraph remain in force until and unless the Agency, in delegating enforcement authority to a State under section 111(c) of the Act, approves reporting requirements or an alternative means of compliance surveillance adopted by such States. In that event, affected sources within the State will be relieved of the obligation to comply with paragraphs (a), (c), (d), (e), and (f) of this section, provided that they comply with requirements established by the State. Compliance with paragraph (b) of this section will still be required.

(Approved by the Office of Management and Budget under control number 2060-0050)

[51 FR 31337, Aug. 1, 1985, as amended at 54 FR 6680, Feb. 14, 1989]